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Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

No. 114

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UN CARTOGRAPHIC MEET DISCUSSES SATELLITE SYSTEMS

Wellington THE EVENING POST in English 25 Feb 80 p 15

/Report by EVENING POST diplomatic reporter/

/Text/ The first "proper" United Nations conference ever held in New Zealand ended on Friday with a rare display of disagreement.

The ninth Regional Cartographic Conference for Asia and the Pacific could also have been the last, if United Nations staff from New York had had their way.

The conference secretary (Mr Chris Christopher), who is the head of the UN Cartography Section in New York, argued strongly that it was time to bring the world's regions together for one conference instead of the series of regional ones.

After pressure from Australia and New Zealand, the proposal was defeated. There will be another Asia-Pacific conference, but the venue is uncertain.

It was an unexpected eruption in an otherwise quiet and techically-orientated meeting.

The conference was a place for developing nations to make contact with aid-giving countries, and a chance for the few developed nations in the region, like New Zealand, to boast of achievements.

Salesmen

Others at the conference were a handful of space race nations from outside the region with urbane delegates selling their satellite mapping systems for all they were worth.

Keenest salesman at the conference was Frenchman Mr Christian Veillas, representing the French National Centre for Space Studies. Armed with colour brochures, films and tick-the-box reply cards, he offered a satellite observation system that can track racing yachts for $3000 down and $25 a day.

In 1984, France will send up an observation satellite capable of sending back pictures of the earth's surface to a receiving station in Toulouse. Mr Veillas argues that it will be ideal for mining surveys with its ability to take stereoscopic pictures.

Commercial teams based in Toulouse are prepared to travel all over the world to sell the system.

Also in the running are the Americans with their Landsat system already operating.

According to Mr Fred Doyle, acting chief of EROS (Earth Resource Observation Programme), it can offer 185km square "scenes" of the earth's surface for as little as $20. The information is beamed down in digital form. Copies of computer tapes are available for up to $200.

Exploring

Mr Doyle said 30 percent of sales so far were to US customers, such as mineral exploration companies, wanting views of other countries. Another 30 percent went to foreign customers. In principle the Russians could buy pictures of the United States taken by the satellite.

Soviet delegates at the conference were reluctant to say much about earth pictures from their intercosmos satellites, but they claimed their cameras could pick up more details than the Americans' although it was impossible to make a simple comparison and say one was better than the other.

They were ready to give any photographic information to any country interested provided the pictures were of that country's own territory. The cost was up to the particular Russian organisations.

The European Space Agency is also making plans to put up an experimental satellite in April 1982 with American help.

According to Professor Gottfried Konecny, of Hamburg, one of the world's leading photogrammetry experts, low flying European satellites will be positioned and retrieved by American space shuttles.

The German firm, Carl Zeiss, is now working on ultra-light cameras for the programme.

Amid these tales of technological marvels is the sobering example of Australia. It has plumped firmly in favour of mounting cameras in high flying Lear jets rather than relying on satellites.

King-size

Professor Konecny said satellite mapping only became economic for continent-sized areas larger than Australia. If the satellites had to work on fine details, they could not handle the volume of information.

There were sales chiefs and company engineers at the conference. Professor Konecny thought selling activity had been "very low key."

It was an intergovernmental conference. When the delegates meet again as professional photogrammetrists or hydrographers or surveyors, the hard selling begins.

CSO: 5500

PROGRESS OF INTERNATIONAL PHONE EXCHANGE IN SOFIA REPORTED

AU291532 Sofia BTA in English 0820 GMT 29 Feb 80 AU

[Text] Sofia, February 29 (BTA)--An international automatic telephone exchange with 800 lines is to be completed in the Bulgarian capital by the end of 1980. The direct telephone links with all socialist countries will be increased.

New 60-channel telephone installations on the Sofia-Vienna line and direct 12-channel lines connecting Sofia with Zurich and London will be put into operation. 417 million leva will be invested during the 7th five-year period (1976-1980) in the updating and reconstruction of this country's communications network. As a result of this, the installed new capacities will be 63 per cent more than in 1975, with 290,000 new telephone posts.

The first electronic exchanges of the "crosspoint" type, made in Bulgaria are already functioning. New Soviet equipment will be imported for increasing the capacity of the subscribers' lines by 6-8 channels which will make it possible to increase the capacity of the network several times. The implementation of a programme for automatic control of radio and TV installations has started. An automated system for control of the country's telephone network will be built. The use of containers is being introduced in the transport of mail and newspapers.

CSO: 5500

BRIEFS

JAPAN-ARGENTINA TV PLANT--Osaka 28 Feb--Sanyo Electric Co announced Thursday a plan to build a color television set assembly plant in Ushuaia, southern Argentina, in a joint venture with Argentine and Panamanian interests. The plant, capable of turning out about 2,000 sets a month, will be owned by San Elco, an equally-owned joint company of Sanyo and Radio Miguel of Argentina, and Peicard of Panama. Production will start this May, Sanyo said. Sanyo said it decided to build the Ushuaia plant because Argentina is scheduled to begin color TV broadcasts this May. The tax on TV parts to be supplied from Japan is low because Ushuaia has been designated as a quasi-free trade area by the Argentine Government as part of its program to promote industrial development of southern Argentina, it added. [Text] [Tokyo KYODO in English 1117 GMT 28 Feb 80 OW]

INDIAN RADIO, TV GROUP IN HANOI--Hanoi 7 Mar--An Indian radio and television delegation is visiting Vietnam at the invitation of the Commission for Radio and Television. It is led by Kaul Anand Narim, deputy general-director of the national radio of India. [Text] [Hanoi VNA in English 0720 GMT 7 Mar 80 OW]

'DPA' in PERU--The chief of the National Information System, SINADI, inaugurated the operation of the German DPA news agency yesterday. [Lima Domestic Service in Spanish 1200 GMT 29 Feb 80 PY]

CSO: 5500

COMMUNICATIONS MINISTER, CPI-M LEADER ON CENTER-STATE RELATIONS

BK080354 Delhi Domestic Service in English 0240 GMT 8 Mar 80 BK

[Text] The state governments are bound to follow the center's directives and rules framed by Parliament. This observation has been made by Communications Minister Mr C.M. Stephen. Speaking at the Meet the Press program in Trivandrum, he said that the center will have to devise ways if a state disobeys the center's directive. According to PTI, Mr Stephen said the Congress-I has got a massive mandate from the people in the recent elections and as such it has to fulfill its pledges to the people. In the process the center will have to see that the state governments cooperate with it in fulfilling its election pledges.

Commenting upon Mr Stephen's remarks, Communist Party of India-Marxist leader Mr Namboodiripad has said that people have given the ruling party at the center the mandate to rule for 5 years. A similar mandate has also been given to the left Democratic Front in Kerala. This fact has to be accepted, he added. Speaking at a function in Trivandrum, Mr Namboodiripad reiterated his party's opposition to the Preventive Detention Act.

CSO: 5500

SATELLITE RECEIVING STATION TO AID WEATHER FORECASTING

Wellington THE EVENING POST in English 4 Mar 80 p 4

/Text/

THE Meteorological Office expects to be able to forecast short and long-term weather much more accurately with the installation of a $500,000 satellite receiving station in late April or May.

Improvement should come in the one to two-day range, and it should be possible to forecast two days ahead as accurately as one-day forecasts are now made, said the division's director (Mr J S Hickman).

The Met Office has come in for sharp criticism recently from several yachtsmen, who claimed they experienced east coast weather conditions markedly worse than predicted.

Mr Hickman said meteorologists were handicapped by a lack of knowledge of present conditions.

"You can't predict the future without knowing the present," he said. There were no weather ships, which would cost as much as all the office's operations put together, and accurate, up-to-date information came from only a few manned islands.

The new station would give accurate information on wind and temperatures throughout the atmosphere and after computer processing would provide data for longer-term estimates.

The high-resolution satellite would provide more detail of cloud patterns than was now available. From this it would be possible to estimate the winds.

The station will receive information from existing Japanese and American weather satellites.

CSO: 5500

PLANNED POST OFFICE COMMUNICATIONS SYSTEMS DETAILED

Christchurch THE PRESS in English 27 Feb 80 p 31

[Text]

New communications systems planned by the Post Office make the telegram and the postman seem as old fashioned as the pony express and the penny stamp.

Coming up, or here, are word transmission at almost 50 times the speed of present telex machines, access to world data banks, and in the distant future, electronic mail.

Mr David Richards, principal of the department's Telecommunications Division, and Mr Neville Wishart, divisional engineer of the Telegraph and Data Section at Post Office Headquarters, outlined possible developments in a joint interview.

They said that the Post Office was thinking of 1982 as a date for the introduction of packet switching. This is a system of transmitting computer data in small "packets"; these are switched as single units. Initially there will probably be three exchanges for the system: at Auckland, Wellington, and Christchurch. New nodes, as the exchanges are called, will probably be installed soon after at Hamilton, Palmerston North, and Dunedin.

The switching exchange is itself a form of computer, and subscribers will be businesses, libraries, universities and technical institutes. Packet switching should be cheaper to the user than present leased lines.

In the long term the packet switching system will probably be integrated with the nation's telephone network. At present telephones are linked by frequency-modulated channels, but telephone messages some day will be broken down into bits of information and reconstructed at the other end of the line.

Another system, but still on the horizon for New Zealand, is teletext. This is a transmission system that could use either packet-switching or the present telephone network. It will enable electronic word processors, the office machines that are enabling one secretary to do the work of many, to communicate with each other.

At present, a word processor may contain a file of stock letters. A secretary merely has to key in perhaps name and an addres, on the screen, and a letter can be printed automatically. Teletext makes even the letter obsolete if the addressee is another business firm. The message will go electronically to the addressee's word processor, where it can be stored to be brought up on screen when required, or printed out.

This teletext system transmits at almost 50 times the speed of the present telex machines. It

is being introduced on a network in France and West Germany next year. New Zealand is likely to wait until character and other standards are decided by international postal authorities. Once this is decided the businessman will soon be able to select a word processor compatible with an international network, and when New Zealand establishes the facilities, the country's electronic mail will have been introduced.

In the meantime, the present telex system will have been improved. The telex system now transmits at 50 bits per second. The Post Office later this year will open a series of new telex exchanges for a 300 bit-per-second service. It has not been decided whether the two telex system will interface. If they do special adaption devices will be needed.

Microwave and cables are likely to remain the main means of trunk transmission; satellite circuits, though becoming cheaper are seen as being more suited to widely spread countries. (Indonesia has a very successful satellite-based system.)

While the Post Office engineers plan to expand services to businesses and institutions, a watch is being kept on progress in introducing the new services overseas that will bring the new technology into the homes of citizens.

The New Zealand Post Office has not made any decision to set up a viewdata system along the lines of the British Office's Prestel, or the advanced systems being developed elsewhere. Prestel enables the home television set to be linked via the home telephone to a databank. Stored information is then printed on the screen.

One of the critical factors will be the cost of the link and controls that will enable the householder to link up to the information system. The French have production contracts let for units that are likely to retail for about $70 each.

Home terminals will open the way for a complete electronic mail service, though postmen will probably be needed for years yet for parcels, and for those who will choose not to have a viewdata link.

Just how close a home electronic mail service may be is reflected by advances in France. When the French viewdata service, at present a pilot scheme of 110,000 units, becomes national in 1982, facsimile transceivers for sending and receiving the "letters" will be available for about $500 or for rent at $15 a month.

For New Zealand, the problem with viewdata, according to Mr Richards and Mr Wishart of the Post Office, is no longer technical. It is a marketing and social issue. There is virtually no information on market demand, or on the implications of a new information medium.

"We are limited no longer so much by what is technically desirable but by what is economically and socially desirable," said Mr Richards.

Cost: $500

POST OFFICE COMPUTER INFORMATION SYSTEM OPERATING

Christchurch THE PRESS in English 27 Feb 80 p 31

[Text]

The Post Office has 20 clients for its O.A.S.I.S. computer information system, which began last September, and others are interested.

O.A.S.I.S. stands for Overseas Access Service for Information Systems, and allow its members to link, through the subscriber telephone dialling network, to two big information systems in the United States.

One of these is Tymnet, based in Cupertino, California. Through this network scores of firms offer computer services or data bases as diverse as insurance actuarial systems, agricultural statistics, patent records, a chemical dictionary, business news, a project management control system, oceanography literature, marketing information, prices of stocks and shares and financial statements of 2000 European and Australian companies.

The other network, Telenet based in Washington, has a similar range and includes services such as flow charting, plotting-graphics, and simulation. It has daily information from North American stock exchanges, teleprocessing services, a 900,000-item file of references and articles on health subjects and access to the "New York Times" information Bank.

Perhaps the prize item in Telenet is the Lockheed Dialog group of 70 data bases. Periodicals, reports, reviews, patents, conference proceedings, and documents in more than 40 different languages are available through the New Zealand O.A.S.I.S. client's computer.

How much does the service cost? For a business, a modem (this converts computer data to and from telephone signals) will cost $65 to install and the rent is $32.60 a month. The O.A.S.I.S. cost is 60c for every 1000 characters exchanged plus 20c a minute connected. On top of this, the subscriber must pay the American host computer. Charges here seem to vary from about $15 to $30 for each hour on-line to the computer and an additional 10c to 20c per record printed off-line. Typically, each network offers a discount if the user is on-line five or more hours a month.

The Post Office plans to extend O.A.S.I.S. eventually, allowing access to, for instance, the Euronet data network in Europe and Australia's Austinet.

CSO: 5500

GOVERNMENT-FUNDED FM RADIO DEFERRED 12 MONTHS

Wellington THE EVENING POST in English 11 Feb 80 p 4

[Text]

Government funded frequency modulation radio (FM) was yesterday ruled out for at least a year by the Minister of Broadcasting (Mr Templeton).

"The economic climate is not such to justify the allocation of resources to FM at the moment, the Minister said.

He said he had recommended to Cabinet that the introduction of FM as an additional form of radio be deferred for 12 months.

The Broadcasting Tribunal had been directed not to consider any application for a warrant to establish an FM radio broadcasting station during this period.

The minister said he had made his decision after receiving a report from a special planning committee on FM radio. No date has been set for the release of the report which was classified.

BRIEFS

BINH TRI THIEN RADIO NETWORK--Binh Tri Thien Province now has more than 25,000 public and family-owned radio loudspeakers and some 142 wired radio stations and points built by the state and local people. In 1979, the Binh Tri Thien provincial wired radio sector also helped the sister province of Savannakhet in Laos to build a district wired radio station. [BK131315 Hanoi Domestic Service in Vietnamese 1100 GMT 3 Mar 80 BK]

CSO: 5500

USSR MINISTER DISCUSSES ELECTRONICS COOPERATION WITH BULGARIA

AU281750 Sofia RABOTNICHESKO DELO in Bulgarian 26 Feb 80 p 4 AU

[Statement by Erlen Pervyshin, USSR minister of the communications equipment industry, to RABOTNICHESKO DELO correspondent, during his stay in Bulgaria--no date given]

[Text] At the invitation of the Government of the People's Republic of Bulgaria, Erlen Pervyshin, USSR minister of the communications equipment industry, visited our country. Questions concerning the expansion of mutual deliveries of communications equipment and the further development of integration and production sharing between the USSR and the People's Republic of Bulgaria were discussed. The application of a comprehensive approach in implementing the basic task--considerably increasing the production and the volume of the means of communications--is provided for. Cooperation between production and scientific collectives in both countries will be intensified and questions pertaining to the training of the cadres entrusted with handling the most complicated communications equipment will be intensified. Comrade Erlen Pervyshin made the following statement to a representative of our editorial board:

This is the last year of the 5-year plan period, during which economic and scientific-technical cooperation between our two countries in the sector of research and production of communications equipment, signed between the USSR Ministry of the Communications Equipment Industry and the Ministry of Electronics and Electrical Engineering of the People's Republic of Bulgaria in December 1975, is being successfully implemented. The volume of mutual deliveries of communications equipment between our two countries has more than doubled during the present 5-year plan period. As a result of the scientific and technical cooperation existing between the two countries considerable work has been accomplished in setting uniform standards in the USSR and the People's Republic of Bulgaria in the communications equipment sector. A new generation of communications equipment has been developed, which we plan to use in the agricultural sector as well as in the railroad transport sector; in addition, replay amplifiers, digital automatic devices and other communications equipment have also been developed.

The meetings held between Comrade Leonid Ilich Brezhnev, CPSU Central Committee general secretary and USSR Supreme Soviet Presidium chairman, and Comrade Todor Zhivkov, BCP Central Committee first secretary and People's Republic of Bulgaria State Council chairman, as well as the decision to develop comprehensive cooperation and to draw the USSR and the People's Republic of Bulgaria closer together, and the general plan on specialization and production sharing between the USSR and the People's Republic of Bulgaria in the material production sector up to 1990, served as a base in working out plans of scientific-technical and economic cooperation throughout the forthcoming 5-year plan period and for the more distant future.

The expansion of specialization and production sharing and the considerable increase of deliveries will represent the characteristic traits of bilateral cooperation in the communications equipment industry sector throughout the forthcoming 5-year plan period. A comprehensive approach will be applied to accomplishing the tasks assigned to this sector, an approach connected with joint research in preparing and introducing a new generation of communications equipment into the production sector. The links between production collectives and scientific research collectives of both countries is being intensified in connection with solving the problems of the training and education of cadres capable of mastering the most complicated communications equipment.

The USSR Ministry of the Communications Equipment Industry and the Ministry of Electronics and of Electrical Engineering of the People's Republic of Bulgaria have coordinated their scientific-technical cooperation plans, as well as their tables of organization and the tentative size of their mutual deliveries in the sector of communications equipment for the 1981-85 period. A considerable expansion of production sharing between Soviet and Bulgarian enterprises is envisaged in the production of switchgear systems, in the sector of specialized technological and measuring equipment, in the sector of new materials and in the production of specialized elements of microelectronics envisaged for communications equipment. Throughout the forthcoming 5-year plan period, the high rates of increase in mutual deliveries between our two countries will be preserved as it was in the past. The implementation of such plans demands very intense work and a high sense of responsibility from the workers collectives in our two countries' enterprises.

We are convinced that the measures planned for the forthcoming 5-year plan period will help us to raise the standards of the communications equipment produced to a new level and to fully cover our two countries' needs, as well as to increase the competitiveness of our equipment. These measures will give us the opportunity to more effectively use capital investments devoted to the development of the communications equipment industry in our two countries. The friendship between our workers collectives will be consolidated. Such are the methods of implementing the tasks set forth in the general plan of specialization and production sharing between the USSR and the People's Republic of Bulgaria in the sector of material production up to 1990.

CSO: 5500

BENEFITS OF NATIONAL INTERCONNECTION NETWORK DETAILED

Buenos Aires CLARIN in Spanish 19 Feb 80 p 4

[Text] the National Interconnection Network is one of the projects under the [Ministry of] Water and Electric Energy; this is a highly important project both in technical and economic terms.

By virtue of its characteristics and objectives--putting together the network that will link the various power plants--it will make it possible to carry the energy generated by those plants to all of the country's markets. In addition it will make it possible to supply that network with bigger generating equipment which in turn implies, without any doubt, increasing savings in the cost of electricity.

Looking at the projects that constitute the network, we can say that several of them have already been completed while others are in an advanced state. Water and Energy has already begun to operate the 500,000-volt line from Salto Grande to Buenos Aires; in a short time however the section from that power plant to Santa Fe will also be completed.

Work is on the other hand very far advanced on the construction of the power line which, starting from this last-mentioned city, runs along the Parana River and likewise terminates in Buenos Aires.

This means that Salto Grande will get the energy generated and the volume will be increased as other turbines begin to operate.

In addition, a 500-kilovolt line was built to link the coast with the country's center; it is scheduled to go into operation very shortly between Cordoba and Rosario.

Competitive bidding invitations will also be issued shortly to build the power line running from Santa Fe to Resistencia, Chaco, to link up in the future with Yacyreta. For the time being however it will facilitate power from the current system for the northern part of the country.

Another one of the power lines which are considerably ahead of schedule is the one that links the power plant on the Tercero River to the area of Cuyo, on the one hand, and the northeast, on the other hand.

Technical Features

Water and Energy runs the technical side of the National Power Rate Office which will operate in Rosario, thus making it possible to coordinate the tremendous benefits deriving from the network, in other words, its goal is to operate the system's power generating pool and its power transmission network so that the transfer of electric energy between the various interconnected regions can be accomplished in the most efficient, economical, and safe manner.

This system has one technical feature which can be considered intrinsic of the network. In Argentina, the water flow rates of the rivers in the west are not the same as those along the shore. This means that there may be dry spells in the Cordillera Region, while at the same time there may be big floods in the east. "As soon as we have the interconnecting network, it will act as a kind of communicating vessel," said Engineer Anibal Leopoldo Blanco, "so that, when there is a shortage in one region, we will be able to supply it with the surplus from another region."

This is the great advantage deriving from the system and this is the basis for its economic importance. If well-operated, it will permit optimum utilization of all interconnected equipment. "This is what will make it possible to operate those units which, at any given moment, are the ones that best meet the requirements at minimum cost." In general terms, this system will open the way toward lower overall costs.

5058
CSO:5500

ENTEL TO BECOME EXPORTER OF MICROWAVE SYSTEMS

Buenos Aires LA NACION in Spanish 7 Feb 80 p 7

[Text] Col Luis Alberto Amallo, administrator-general of the National Telecommunications Enterprise, yesterday signed an agreement with the general manager of ENTEL [National Telecommunications Company] of Bolivia, Mr Jorge Soriano Badani, through which the Argentine government enterprise will provide and install in this neighboring country the microwave interconnection equipment and related equipment that will link the ground telecommunications systems of both countries.

The work involves a contribution from the government of Argentina and this will make it possible to complete the links already existing with Brazil, Chile, Paraguay and Uruguay.

The localities which will be interconnected are Campo Duran, in Argentina, and Tarija, in the Republic of Bolivia, with intermediate repeaters at Sanandita, Junaca, and Sama. On the other hand, ENTEL of Bolivia is doing the work necessary to facilitate communications for the above-mentioned localities with La Paz.

Agreement

According to the agreement, the Argentine telephone company will supply microwave systems, related equipment, energy components, structures for the support of antennas and the civil engineering work necessary to house the equipment, plus training for Bolivian technical personnel needed to operate the new installations.

During the ceremony held in the headquarters building of ENTEL in this capital, Col Amallo emphasized the fact that the agreement with Bolivia "makes for even closer bonds, leading to the integration of the Latin American countries." In conclusion it must be stressed that this is the first time that Argentina will install equipment in a neighboring country, thus becoming an exporter of microwave systems.

5058
CSO:5500

DIRECT DIALING SYSTEM PLANNED FOR MAIN CITIES

Tehran TEHRAN TIMES in English 12 Mar 80 p 2

[Text] Tehran—The Ministry of Post, Telephone and Telegraph has embarked upon an ambitious plan to connect all the important cities of Iran with the outside world on a direct dialing system.

A major step in this direction was taken recently after the city of Kerman was provided with the direct dialing system to 24 important countries of the world.

Plans are in hand to provide similar facilities to other important cities and provincial centres in Iran.

Since the direct dialing system for foreign countries has been provided to the city of Kerman for the first time, the telephone holders in this city have been advised by the PTT ministry to be careful about their telephone apparatus which might be misused by others adding exhorbitantly high bills of their telephone charges.

An official of the Iran Telecommunications Company said that India, Pakistan and Bangladesh were not included in the list of 24 countries which could be contacted through direct dialing from Kerman.

CSO: 5500

SATELLITE COMMUNICATIONS SYSTEM UNDERGOING TRANSITION

Oslo TELEKTRONIKK in Norwegian No 4,19'9 pp 349-357

[Article by E. M. Hemb]

1. Introduction

[Excerpts] Saudi Arabia is about nine times as big as Norway; the satellite system is in a transitional phase. A radio line net of really large dimensions is being built and has been partially put into operation. The cost of a radio line net is nearly 30 times as high as for a satellite communications network, which is of the order of magnitude of 160 to 180 million kroner. To this must be added investments for telephone exchanges, cable channels, telephone instruments, etc., which have to be provided in any case.

Saudi Arabia also has two big satellite stations for international communications and is planning for another station.

The two existing stations both have 32-meter antennas and are situated in the vicinity of Riyadh in the interor of the country and at Taif near Jedda on the west coast.

The station at Riyadh works in a transponder in a satellite over the Indian Ocean, while the Taif station uses a transponder in an Atlantic Ocean satellite. There is thus coverage already over two ocean areas. The traffic is so great that this is still not adequate. For that reason a contract has been entered into for construction of a big new station side by side with the "old" station at Riyadh. The new station will be opened in 1980 and receive traffic across the Atlantic, which is the most important for Saudi Arabia.

During the year that I had the pleasure of working in the Ministry of Post, Telephone, and Telegraph at Riyadh the domestic satellite system was put into full operation and we planned and wrote contracts for the new station in Riyadh.

During that time the ministry also entered into a very large contract for operation and maintenance of the land-line telephone network, with exchanges, cable network, and other installations all over the country. The satellite systems were excluded from that contract, and a separate contract was concluded for them, including both the international stations and those which were part of the domestic system. Both contracts contained provisions concerning training Saudi Arabian personnel, and much weight was placed on training native people.

2. DOMSAT [Domestic Satellite] System

The system consists of 11 ground stations, more or less permanently localized, as may be seen from Figure 1. In addition, a mobile station has been furnished, complete with its own power station, for semipermanent use where there is need for communications that cannot be covered in any other way. That is, at inaccessible places beyond the range of the radio line network. Such places are numerous in Saudi Arabia. The satellite communications system essentially covers the western part of the country, as the southeastern part consists of desert ("The Empty Quarter"), and the eastern part, with the oil wells, is covered in another way.

The greatest part of the country's population lives in or around the cities, as the figures show. The coverage is good in that respect.

In addition to the 12 stations mentioned, the oil company Aramco has 2 stations that will be used for east-west communication in connection with an oil pipeline.

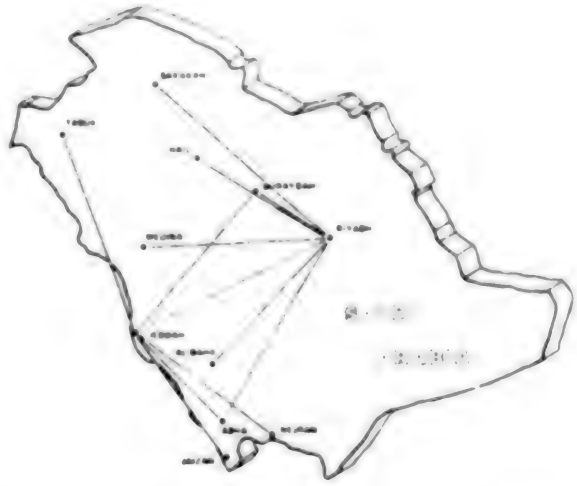


Figure 1. General View of the DOMSAT system as it was at the beginning of 1979.

Two other stations have been dismantled, and one of them was to be given to Samalia for use as a Standard B station in the INTELSAT system.

The DOMSAT system is connected with the international INTELSAT system via Standard A stations in Riyadh and Taif. Later the radio lines will take care of this connection, and thus avoid a double step, a thing that makes international connections hard to use for untrained customers because of the long delays.

3. Transponder Requirements

The system operates through two leased transponders in an

Atlantic Ocean satellite with "global beam" antennas. The following services are provided over the system: A color television channel (Secam III-B), three wideband program channels, one of which is a sound channel for the television programs and the other two for radio programs. And 300 duplex telephone channels.

In addition, the system is planned to be compatible with future Arab satellites, which will have characteristics similar to those of INTELSAT IV.

Figure 2 [not reporduced here] shows the layout within the two transponders.

4. Ground Stations in the DOMSAT System

The block diagram of Figure 3 is a representative simplification of all the ground stations, apart from the fact that only Riyadh can send television with its accompanying sound channel. All of the stations can receive television and radio programs. All stations can send radio programs and have two-way telephone and telex channels. Three stations have no connection with a foreign exchange, because they are connected in another way, either via the A station in Riyadh or that in Taif. After the radio lines have been put into operation the foreign connections will be attached to them, too, and thus the problem of double step will be avoided.

The stations are constructed in transportable prefabricated houses that can be moved. All of them are provided with their own power plants with three diesel generators. The power requirements for the stations are great. It can be seen from the block diagram that a great deal of the equipment is in a redundant configuration. The total load is over 100 kw. The price of diesel oil is only about 10 øre a liter in the amount used here, so that the consumption does not come to much in money.

The ambient temperature at the stations can be about +45°C in the daytime and about 38-40°C at night for more than 5 months of the year. Central air conditioning is therefore needed in all the buildings belonging to the stations. Without such installations it is obviously impossible to keep much equipment in operation. If the air conditioning breaks down it is also impossible to keep personnel on the job for long at a time. Even in the winter the ambient temperature during the day can easily go up to +30°C. This means in practice that the cooling system must be in operation the year round.

The station at Riyadh is located side by side with the A station, but is independently supplied with power. The antenna, which is an 11-meter "wheel-and-track" type with step track system, is located side by side with the hut that houses the RF equipment with modulators and power stage as well as the signal conversion equipment. The channel equipment and multiplex equipment is housed in another hut nearby. There are also two more huts at this station, fitted out with kitchen, bedrooms, toilets,

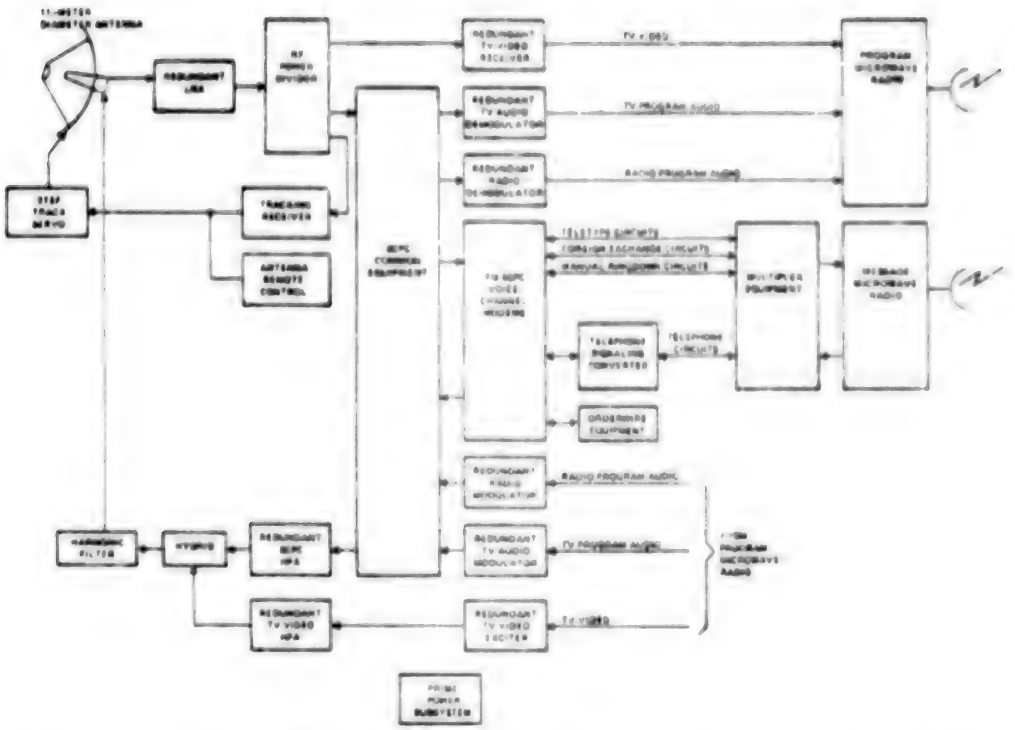


Figure 3. Block Diagram of the Station in Riyadh. This station is the only one that can send TV. Apart from this difference the other outstations are constructed with the same units as that in Riyadh.

and lounges. They are also air-conditioned. The Riyadh station is perhaps the one with the highest surrounding temperature of all. It is situated low in a valley, and besides the direct solar radiation, which can exceed 1,000 watts/m^2, it also receives indirect radiation from the hillsides. On two occasions during the summer of 1978 I measured +56°C in the shade there in the middle of the day. There were never any problems with the air conditioning, however, either at the DOMSAT or at the A station, at these temperatures.

4.1. The A Stations

As mentioned earlier, Saudi Arabia currently has two international stations, while a third for Atlantic traffic is under construction.

Figures 4 and 5 [not reproduced here] show the Riyadh and Taif stations respectively.

They were both built by a Japanese firm, and have worked quite excellently since they were put into operation in 1975.

The anti-interference amplifiers and all the rest of the equipment except the cooling units are placed inside the house. The cooling units use water as the heat-transmission medium, and the heat exchangers are placed at strategic places in the installation. There is alternating current "no-break" with static inverters from batteries.

Although the stations were built in 1973-1974 with enough room for future expansions, it has been found that the traffic requirements are so great that we have had difficulties in getting the new equipment in.

At Taif we have had to plan for a new power plant, which is being built in a new building by the side of the existing buildings. This way the present power plant there can be put to use for new communications equipment.

In Riyadh there will be three stations in the future, when the new A station is put into operation in 1980. The new station will be an imposing building.

At first all the power for the three stations will come from a common power plant with five turbine-driven alternating current generators, at least three of which will be in simultaneous parallel operation. For transmission of the power around the big installation we went in for high-tension transmission; the total amount of power can be built up to 1,500 kw, and the internal distances within the installation are great.

The station building will contain a big control room, which in addition to control of the new station will also take care of remote control of the "old" A station. There will be no noisy installations in this building, which will have a number of offices for the staff with the station director at the top, and a big lobby and VIP room with its own toilets and canteen which can serve up to 50 persons. There is an auditorium for an equal number with film-projecting facilities and color television for educational purposes. It is possible that in time an ARABSAT station will be established in the same station area, and then even the new main building will be too small. But there is concern about the possibilities for expansion.

The antenna building, as usual, is beneath the antenna, and will house the power amplifiers, up and down converters, channel equipment, multiplex equipment, and the radio line terminal for a new radio line to Riyadh. The existing one will continue to be used, but we found that we wanted to put in another line with a somewhat different route for security reasons. Since the station is so far from Riyadh, a number of houses are planned to house the permanent personnel that do not prefer to live in the city. Tennis courts and a swimming pool are also planned. Water supply is especially important in such places. If water is not to be brought in by tank truck, it will be necessary to drill for ground water. It is often hard to get permission to do that, and we did not get it while I was involved in the matter. The evaporation from a swimming pool is colossal, and it is not unusual for the level to drop 10 cm in 24 hours.

with the other SCPC carrier waves and converted up to 6 GHz. The signal then goes through the corresponding HPA, hybrid (3 dB) filter, and together with the television sound signal to the antenna horn; cf. Figure 3.

In the receiver direction the signal from the antenna goes first to the redundant anti-interference amplifiers, to a four-way distributor which drives the redundant television picture receivers and the SCPC common equipment. The television sound goes from the SCPC common equipment to a wideband FM program channel demodulator. The output from the program channel demodulator and from the video receiver go to the TV studio via separate redundant radio lines.

6. Radio

The radio programs are handled in the same way as the television sound channel. Modulator and demodulator are redundant, but the outstations can send programs to Riyadh on the channel that is not used to send to the outstations. The radio programs are in mono, while the local FM broadcasts in Riyadh are in stereo.

7. Telephony

As Figure 1 shows, there are certain cities that have ground stations, and they have a certain number of preassigned channels. The reason for this is that it makes the simplest system to begin with, when "bugs" can be expected in the system. And there were bugs, and plenty of them. It can also be seen from Figure 3 that all outstations are directly connected with the two biggest cities in the country, either Riyadh or Jeddah, or in two cases both cities. In addition, for long-distance selection to and from the districts of the outstations there are a number of special services--lines to the international exchange in Riyadh from the outstations, manual ring circuits between Riyadh, Jeddah, and the outstations, and telex lines, as well as special VIP communications to individual places, etc.

The coverage area of the individual stations in the land-line network has its boundary section in a switch network in the local exchanges and a cross connection via radio line or cable. The signaling for the automatic telephone service goes to and from the ground station via a "Telephone Signaling Converter," as may be seen from Figure 3. It looks insignificant in this block diagram, but it is rather complicated equipment which occupies a big place. The primary function of this equipment is to convert the local ringing signals to a format adapted to the satellite system and back to the local ringing signals at the receiver end. The signals need not be the same locally at each end. The equipment is in full duplex and permits simultaneous transmission and reception by each of the automatic long-distance selection connections.

The TSC [telephone signaling converter] equipment need not be located at the ground station, but can be installed at either end of the automatic long-distance selection link.

The Single-Channel-Per-Carrier (SCPC) equipment is conventional. It consists of two main units, the FM channel modulator and the common equipment. Each voice channel unit takes care of modulation, demodulation, and other functions for its "own use."

A "threshold extension demodulator" is used to give good voice quality at low C/N. There are also, as usual, preemphasis and deemphasis, squelch, compands, and VOX. VOX is also called voice detector. It ensures that the carrier wave drops out in conversational pauses to save power in the transponder.

The common equipment includes IF signal distribution units which sum the outputs from the channel modulators and send the sum on to the converters. In reception we have the inverse function.

In addition there are redundant up and down converting equipment, a pilot receiver, and a frequency reference unit.

The Riyadh terminal has a 3 kw klystron in the power amplifier, since that station has so many channel units, while the outstations have 1.5 kw tubes. In the receiving direction the 4 GHz carrier waves go from the anti-interference amplifiers to the common equipment via a four-way RF distribution unit.

The voice channels are also tunable with the aid of additional control signals, since they were to be used in a DAMA system later.

DAMA (Demand Assigned Multiple Access) equipment was purchased at the same time as all the rest to be installed in the system at a later time. This equipment would give fully automatic DAMA service between all terminals in the system. By converting most of the assigned long-distance selection connections to DAMA operation, the system's capacity would be greatly improved, and also there would be direct one-step communication between any terminals in the system.

The equipment consists of a central redundant control computer which would be installed in the Riyadh terminal and special signaling channels with system controls for each of the outstations. In this way the computer would take care of tuning the channels according to need within the system and making them available where they are needed. For example, it would be possible for Sakakah to make connection with Tabuk (see Figure 1) with the same channel equipment that would be used the next time between Sakakah and Hail on a different frequency. The control and the "retuning" would be controlled, as mentioned above, by the computer in Riyadh. Another advantage would be that an operator in Riyadh could, by remote control through the computer, arrange the channel equipment at any outstation according to a predetermined schedule to take account of special communications problems that might turn up.

The DAMA equipment thus includes equipment that collects status information from many parts of the station equipment and can transmit this to the

1 Program channels
880 MHz Channel Slots
0.6 Activity Factor

Atlantic Ocean Satellite, Elevation = 30°

Parameter	Units	Program Channel	Telephone Channel (SCPC)
IF Bandwidth	kHz	240.0	36.0
Transmitter Power	dBW	15.7	3.7
Transmitter Losses	dB	5.4	5.4
Antenna Gain	dB	54.5	54.5
EIRP	dBW	64.8	54.8
Tracking Loss	dB	0.5	0.5
Free Space Loss (6725 MHz)	dB	200.1	200.1
Beam Edge G/T	dB	-18.6	-18.6
Geographical Gain	dB	0.8	0.8
Uplink CNR	dB	21.2	19.4
Transponder C/IM	dB	36.5	23.2
Beam Edge EIRP	dBW	22.0	22.0
Output Backoff	dB	17.0	27.0
Geographical Gain	dB	0.8	0.8
Free Space Loss (4000 MHz)	dB	196.2	196.2
Tracking Loss	dB	0.5	0.5
Receive G/T	dB	31.7	31.7
Downlink CNR	dB	14.0	12.2
Composite CNR	dB	13.3	11.0

Transponder Output Backoff 2.5 dB
Transponder Input Backoff 5.1 dB
Saturated Flux Density - 73.7 dBW/m²
Total Transponder Beam Edge EIRP 14.5 dBW

Figure 10. Half transponder SCPC and Program Riyadh-to-Riyadh, satellite at 359° East longitude.

Atlantic Ocean Satellite, Elevation = 30°

Parameter	Units	Television Video
IF Bandwidth	kHz	25,000
Transmitter Power	dBW	24.8
Transmitter Losses	dB	5.4
Antenna Gain	dB	54.5
EIRP	dBW	83.9
Tracking Loss	dB	0.5
Free Space Loss (6725 MHz)	dB	200.1
Beam Edge G/T	dB	-18.6
Geographical Gain	dB	0.8
Uplink CNR	dB	20.1
Transponder C/IM	dB	--
Beam Edge EIRP	dBW	22.0
Output Backoff	dB	0.8
Geographical Gain	dB	0.8
Free Space Loss (4000 MHz)	dB	196.2
Tracking Loss	dB	0.5
Receive G/T	dB	31.7
Downlink CNR	dB	11.8
Composite CNR	dB	11.0

(SECAM B)

Transponder Output Backoff ~ 0.8 dB
Transponder Input Backoff ~ 4.2 dB
Saturated Flux Density - 73.7 dBW/m²
Total Transponder Beam Edge EIRP = 14.5 dBW

Figure 11. Full transponder television Riyadh-to-Riyadh, satellite at 359° East Longitude, single-carrier operation.

computer in Riyadh either automatically or by command from the control panel.

This would make it possible to have unmanned outstations and save great expense for personnel as well as to have a more effective maintenance routine.

Because of the "bugs" in the system mentioned earlier, it was decided not to install DAMA equipment.

8. Quality of the System

As mentioned earlier, all stations have 11-meter antennas with "step track" control. There is access to whole transponders with "global beam" in an INTELSAT IV satellite. The system is carefully planned with precise control of the levels for the three services involved, so as to wind up with acceptable conditions when the services are in operation simultaneously.

Attention must be given to the signal/noise ratios in all receivers, and care must also be taken that the intermodulation levels stay within certain

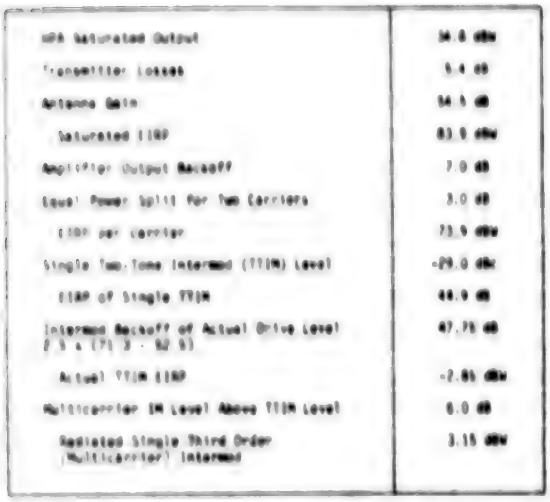


Figure 12. Single radiated third product power.

Parameter	Total Number
Telephone Channel	160
Interstation Orderwire	1
Telephone Pilot Tone	1
Program Channels (@10 Telephone Channels per Program Channel)	30
Total Number of Simultaneously Amplified SCPC Signals	192

Figure 13. Riyadh SCPC signals.

limits. Spurious signals that fall within the band interfere with desired services, and spurious signals outside the band interfere with other users in other transponders.

It would take us too far afield to give a complete conventional calculation here.

A link budget for a Riyadh-kiyadh loop via a satellite in position 359° east longitude is shown in Figure 10. These figures apply to telephony and program channels. A corresponding set-up for a television program over a whole transponder is shown in Figure 11. It will be noted that the receiver G/T is 31.7, which is normal. EIRP for a telephone channel, as may be seen from Figure 10, is 54.8 dBW. Using that figure leads to the figures in Figure 12.

INTELSAT Standard B specifications have no requirement for SCPC/FM, since this is not used in the international net. There are specifications, however, for the permissible extraband intermodulation level for PCM SCPC. On the basis of those, a goal was set up for the DOMSAT system:

$$(\text{IM})\ \text{limit} = 50 - 20 \log N\ (\text{dBW}),$$

where N is the number of carrier waves in the SCPC system.

If we use the currently radiated third order intermodulation product of 3.15 dBW from Figure 12, we conclude that the maximum load of simultaneously amplified signals is 220.

Figure 13 shows that the present number of carrier waves in the Riyadh ground station is 192. We are thus below the maximum number.

9. Experience With the System

The DOMSAT system was ordered in the fall of 1977 from the American firm Harris Corporation, which has supplied similar systems to several countries in Africa. The first system was supplied to Nigeria, with a total of 19 stations, including 3 television channels, 3 wideband radio channels, and nearly 1,200 fully duplex telephone channels. It was installed in 1976. Sudan also got a system with 14 stations, 2 wideband radio channels, and 100 fully duplex telephone channels.

Uganda got three ground stations, including one Intelsat Standard B station for overseas traffic. Here there is television and telephone service simultaneously in one transponder in the two stations devoted to the domestic system.

There was thus a great deal of experience behind the order from Saudi Arabia to Harris. The whole complicated system with all 11 stations was manufactured, shipped, and put into operation in the course of about 7-8 months.

When the author arrived in the country at the end of February 1978, there was only one station that had not yet had traffic.

There had been complaints, however, that the accessibility was unsatisfactory. There was great suspicion of the signal conversion equipment, but there could also be other causes. NORCONSULT took part in the investigations and discovered a number of connection errors at the Riyadh Maintenance Center (ITMC). The programming of the TSC equipment was found to have a number of shortcomings, often "getting hung up" after the end of a conversation and so being blocked. All of these things were gradually corrected. The thing that could not be remedied was the increasing traffic, which became too great even for the DOMSAT system. It is hard to imagine in advance what happens when a city of 20,000-30,000 inhabitants that has previsouly been without telephone communication with the world around it suddenly gets the possibility of direct dialing to a large part of the country. Everybody will try to chat with relatives or acquaintances in other cities and towns, and the result is that only the lucky ones get through. The rest complain.

The Saudi like football and other sports events. The whole country got its program via DOMSAT, and that made complaints come in as soon as there was the slightest trouble.

A number of problems arose from the fact that inadequate spare parts had been bought with the stations, but the firm had laid in buffer stocks in its own interest, and that helped a great deal.

It was an interesting experience to work with these systems in Saudi Arabia, but, as mentioned at the beginning, the capacity even in this system is small on a country-wide basis. But it was far-sighted of the ministry to put its stakes on DOMSAT, which can be of use at other places in the country that cannot be reached by the new radio line system.

8815
CSO: 5600

SEYCHELLES PARTICIPATION IN PANA NEGOTIATIONS DESCRIBED

Technical Benefits Expected

Victoria NATION in English 6 Mar 80 pp 1, 2

[Excerpts] Seychelles hopes to benefit technically through membership of the Pan African News Agency (PANA), the setting up of which is to be discussed shortly in Khartoum, Sudan.

Attending the conference is the Principal Secretary for Foreign Affairs, Mr Jeremie Bonnelame, and the Editor of the national news agency, Seychelles Agence Press (SAP), Mr Rene Morel, who hope to participate actively in discussions on the technical aspects of the African news agency network.

Plans for PANA, adopted by members of the Organisation of African Unity (OAU) in 1979 after years of discussions, call for the setting up of national news agencies which will form the base of the continental network.

Member countries of PANA are divided into five regions, each with its central news pool: Libya for the North; Zaire for the Centre; Sudan for the East; Nigeria for the West and Zambia for the Southern region. Each pool will collect information from the countries within its region to be passed on to PANA headquarters for worldwide dissemination.

It is under the clause for setting up of national news agencies that Seychelles hopes to obtain technical help in modernizing SAP and making it more efficient.

From the three-day PANA conference in Khartoum, Mr Bonnelame is expected to proceed to the Addis Ababa Headquarters of the OAU for a Council of Ministers meeting on the outcome of the Zimbabwe independence elections.

Official Describes Meetings

Victoria NATION in English 14 Mar 80 pp 1, 2

[Text] Seychelles extended its foreign policy of total independence in political cooperation with other countries to the concept of the Pan-African News Agency (PANA), said Foreign Affairs Principal Secretary, Mr Jeremie Bonnelame, on his return to Seychelles yesterday afternoon.

Talking to the Information Services at the airport shortly after returning from visits to Khartoum and Addis Ababa, Mr Bonnelame, who represented the Ministry of Education and Information, said that in all the conference of the East African Regional Pool of PANA had gone well for Seychelles.

From March 6 to 10, six of the East African region's members met in the Sudanese capital of Khartoum to discuss technical preparations for the practical launching of PANA in the Eastern Region.

"However," said Mr Bonnelame, whilst we originally met to discuss equipment problems in the communication of information between national agencies, regional centres, and the PANA headquarters in Dakar, Senegal, it turned out that Seychelles had to be constantly on guard against subtle attempts to divert PANA from its political objectives."

On these objectives the Principal Secretary explained that for some time it had been noticed that foreign news agencies were distorting events in developing countries. Wary of the progress of emerging states these agencies interpreted events according to their interests and policies.

To combat this, member states of the Organisation of African Unity (OAU) have for some time been discussing a "new international information order" whereby each African country would be able to present its policies and aspirations to the outside world without fear of misrepresentation.

"Another thing we noticed" Mr Bonnelame said, was that many industrial nations were wary of the idea of a coordinated news agency for developing nations that aimed to be totally independent. What they are now trying to do is to infiltrate at either the national, regional or central levels of PANA by taking advantage of our need for technical equipment and personnel expertise.

"In Khartoum the Seychelles delegation, which included Mr Rene Morel, the Editor of our national news agency, Seychelles Agence Press (SAP) had to work very hard to combat this adverse influence. We had to take the floor time and time again to insist on the independence of the whole network in all fields."

As far as our own agency SAP is concerned, Mr Bonnelame is confident of our ability to remain independent of foreign influence. He pointed out that

the personnel problem--whether technical or journalistic--was being taken care of. As far as equipment was concerned, Seychelles, true to its co-operation policies, would be as careful as ever in accepting the cooperation of only those countries that had no strings attached to their aid packages.

Mr Bonnelame also talked at length on SAP's preparations for the practical launching of PANA's eastern region pool.

On the national level, Mr Bonnelame said SAP needed a telegraphic transmitter for simultaneous transmission of information both national and from PANA, to the different government ministries and embassies in the Republic.

On the international scene, the problems were bigger he said. The news agency needed electronic radio, telephone and telex news as well as photographs from PANA and the rest of the world, an antenna for clear reception and transmission and a radio transmitter to help cut down the cast of telex dispatches.

The PANA network will have its headquarters in Senegal and five regional centres: Libya for the North, Nigeria for the West, Zaire for Central, Zambia for the South and Sudan for the East.

Each national agency will transmit to its regional centre to be onpassed to the Dakar headquarters, which will then retransmit all the dispatches to the rest of the continent and the world outside.

"It is guaranteed that news from national agencies will not be altered in any way whatsoever during retransmission by regional or Dakar centres," said Mr Bonnelame.

"In this way we will assure that there will be no distortion of facts, which is what we are fighting against."

The Eastern Pool will begin functioning on July 15, to be followed by the whole continental network once all technicalities have been ironed out.

CSO: 5500

PLANS FOR KITALE TELEPHONE EXCHANGE

Nairobi DAILY NATION in English 8 Mar 80 p 3

[Text]

KITALE will be linked to the rest of the world through the Subscriber Trunk Dialling system through a Sh. 3.5 million telephone exchange to be built soon.

The plans were announced by the chairman of Kenya Posts and Telecommunications Corporation, Mr. Dawson Mlamba, when he and members of the corporation's board of directors paid a courtesy call on Trans Nzoia DC Antony Oyier.

Mr. Mlamba said the exchange would ease the current congestion and delays at the Kitale telephone exchange. He said it would provide 1,000 extra lines and 960 channels.

He also said a post office complex would be built at Endebess, 12 miles from Kitale.

Mr. Mlamba said his corporation's immediate plans in the district included the installation of telephones in rural areas.

He told the DC that work on telephone links between Kitale and Saboti was being done and, after finishing it the technicians would move to other areas.

Mr. Mlamba explained that the board was on a fact-finding jmission to enable the corporation to lfind solutions to problems facing wananchi.

The DC told the board members that the efficiency of the corporation would greatly boost development in the area.

KP&T board members accompanying the chairman are Silas M'Mugambi, Adrian Shitaka, Dr. Maruice Dang'ana, Burudi Nabwera and A. Onyango.

CSO: 5500

CREATION OF SATELLITE NAVIGATION SYSTEM FOR SHIPS NOTED

LD251429 Moscow TASS in English 1334 GMT 25 Feb 80 LD

[Text] Moscow, February 25, TASS--A program for a broad use of spacecraft for sea communication and shipping has been outlined in the Soviet Union. With this aim, a system is created providing for the use of artificial earth satellites of the Cosmos type. An all-union Morsvyazsputnik (sea communication satellite) organisation has been set up under the USSR Ministry of Merchant Marine. It will be charged with processing data received by means of Soviet and international artificial earth satellites necessary for ensuring communication and navigation on high seas. The satellite system will eliminate breaks of many hours in radio-communication between sea-going ships and ports caused by magnetic storms and other radio interference. The "ship-satellite-ground station" radio bridge will speedily and effectively link subscribers.

Already now, big Soviet ships under construction are equipped with satellite communication apparatuses, due to which the control of ship traffic will be more effective in future. The communication system will be used also in navigation. Satellites may become outer space beacons. The USSR is a member of the INMARSAT international satellite communication organization, which was set up recently. The convention on its establishment came into force in July last year. The aim of INMARSAT is the control of a system, which is to be created on an international basis for ensuring communication between sea-going vessels and coast by means of space satellites.

CSO: 5500

NEW TECHNOLOGY TESTS TRADITIONAL TELECOMMUNICATIONS POLICY

Helsinki UUSI SUOMI in Finnish 12 Feb 80 p 11

[Article by Licentiate in Technology Gunnulf Martenson: "Communication Station to Replace Telephone"]

[Text] The rapid development of electronics is bringing about vast changes in many areas. Electronics became involved in communications several decades ago, but it is only now that its effect is really being felt. It is possible that half of all the telephone equipment will be connected to electronic centers already before the year 2000. But will they be telephones anymore? The complete electronic connection of the future will make it possible to establish communication stations, from which speech, pictures, texts, and information can be transmitted.

Today's vast interest in information transmission and computers is the result of a rather simple cause: electronics is developing rapidly.

Let us recall some of the rapidly developing areas of past decades: wood processing, the machine industry, automobiles, and ship building. All these areas are continuing to develop and grow securely, surely, and slowly.

Only in a few areas is the growth rate revolutionary and electronics is one of them. The application of electronics can be found anywhere: automobiles, household appliances, instruments, watches, factories, and offices.

Thanks to electronics equipment operates more accurately and with greater reliability. Electronics can be quickly adapted to rapidly changing conditions of operation and in the event of a breakdown an alarm can even indicate the location and cause.

All these properties can be used effectively in the transfer of information. The newest telephone exchanges are already electronic and they contain no moving parts. Soon the copper conduit bringing messages to a subscriber will no longer conduct electric signals corresponding to sound waves, but just a succession of pulses. Thus it is possible to talk about a completely electronic connection.

Engineering Is Only a Part

Engineering only creates the basis for the development of information transfer. Engineering determines what is possible and economics determines what is feasible. The needs of man and society, on the other hand, determine what should be done. We are already apparently in a situation in which the technical possibilities of the equipment exceed our ability to put them to use.

The volume of service is of decisive significance from an economic point of view since basic expenditures are frequently large. For this reason the less frequent services remain the subjects of interest for special application or for those people who do it as a hobby. In this article the emphasis will be on a discussion of the question with respect to the telephone; or the kind of instrument that will probably replace the telephone at the end of this century.

Importance of Old Technology Remains

The progress made in the area of electronics does not mean that all old and already existing technology will lose its significance. The railroad did not become unnecessary when the automobile was invented, and the automobile did not disappear when the airplane was invented.

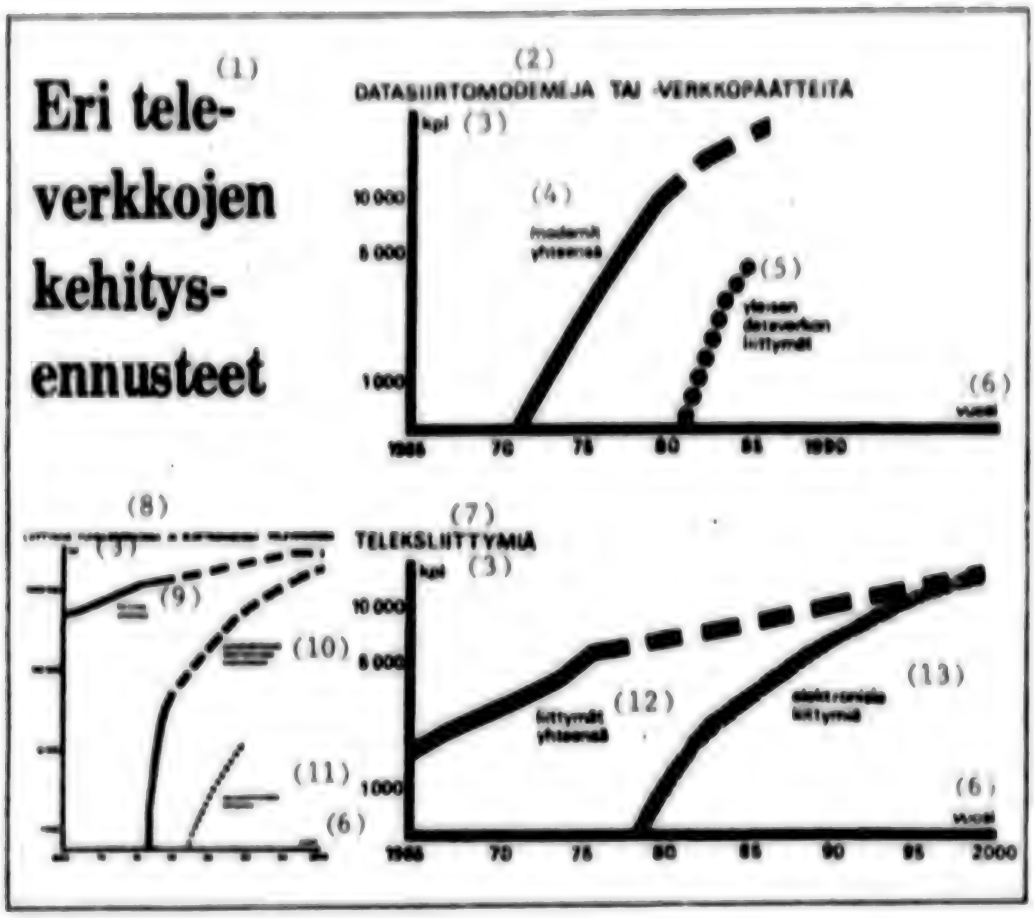
It has taken more than 100 years to build the telephone network. It forms an unseen "road network" on which people will still "drive" even in the next millennium. Gravel roads have not yet disappeared from Finland even though asphalt highways have been built since the 1940's.

The cost of renewing the telephone network is estimated to be approximately 20 billion markkas. Annual investments are approximately 1.2 billion markkas or half of the expenditures for the construction of a nuclear power plant.

This network is built by using conventional copper conductor cable and the telephone exchanges are made up of relays. The telephone instruments themselves have the same carbon microphone that was used 100 years ago. It will take a long time before these are replaced.

If we were to double today's investments and tear down the present network at the same rate that new equipment is installed, it would take perhaps 15-20 years before the new equipment would completely replace the old.

This must be kept in mind when we talk about new communications services. They represent a rapidly growing and very interesting field, which possesses vast opportunities, but for the time being a rather small part of the total field of communications.



Key:

1. Development predictions for various tele-networks.
2. Data transfer modes or network terminals.
3. Number of units.
4. Total number of modes.
5. Connections of overall data
6. Year.
8. Connections in telephone network and electronic tele-network.
9. Total number of connections.
10. Telephone connections in an electronic exchange.
11. Completely electronic connections.
12. Total number of connections
13. Electronic connections.

Electronic Tele-Network Will Create New Dimensions

If we try to predict the development of communications at the end of this century, today's situations and trends are in themselves a clear point of departure. We already know alot about the future. In fact, we have played our hand by constructing networks and plants in a certain manner, concluding long-trade agreements, and training people in certain tasks. Only a catastrophe could quickly change the course of events.

The predictions concerning future development are based on predictions for Finland's future communications as well as on experience gained primarily in the United States and Sweden. Growth continues even though the number of telephones per resident in these countries is greater than in Finland. At the end of the century completely electronic connections in the telephone network, a general data network, and a telex network will serve the same consumers pretty much in the same methods of service. There has been no attempt to predict the distribution between them.

Present Tele-Networks Are Sufficient

When the telegraph was invented, man set about constructing a telegraph network. When the telephone was invented, man set about constructing a telephone network. The invention of remote typing created a telex network and now computers need a data network for mutual communication.

Such a system in which a network is built for each form of communication cannot continue. It is imperative to develop new tele-services in such a way that the majority of them can be connected by means of various-terminals to the same or several different tele-networks.

Such networks could be comprised of an electronic telephone network as well as -- sometime in the future -- a video-network for the transfer of moving pictures. Separate networks, which are formed by separating a leader from the general network, will be needed for special needs.

Electronic Subscriber Switches

Subscriber switches are intended for the internal communications of an enterprise or organization. They are connected to the overall network by several conductors for transmitting conversations to the outside. The renovation of this kind of a small isolated point is considerably easier than a general network.

For this reason the innovations of tele-equipment are frequently tried out first in subscriber switches before they are applied to the general network. Hundreds of semi-electronic consumer switches or series telephones are already in use in Finland, including a few large switching systems.

The size and the electric consumption of the new switches will be reduced. Their operation will be adapted to the needs of the organization in which they are to be used. In the future the sucscriber switch will perform functions other than simply transmitting calls. It will become a general control for the transfer of information, which will be connected to a telephone-, data-, and if need be, also a telex-network.

Connection with an overall tele-network can be accomplished by means of completely electronic connections, which will improve audibility and the speed of data transfer will increase approximately tenfold. Telephones, video transfer equipment, display terminals, or communication points formed from them can be connected to such an electronic switching system.

The Telephone

In the opinion of many people the telephone is a relatively simple piece of equipment. A dial and a device with a microphone on one end and a receiver on the other -- that's all.

It is expected that digital [touch tone] telephone equipment will make an actual breakthrough in the near future. For the time being, cost has been an obstacle. In the 1990's telephones with dials will no longer be available.

The change will be greater than just the replacement of a dial with a digital system since more apparatus and functions can be attached behind the buttons than what was possible in conventional telephone equipment: the selection of even a long series of numbers by pushing a single button, an ability to repeat the last number called, an electronic tape recorder for a short message, and a small display unit similar to that of a pocket calculator, which confirms whether the correct number was selected. The same display unit can be used to show the number of rate schedule in pulses so that the cost of the call can be determined immediately.

All these functions have already been accomplished with various equipment, but they are still expensive.

The selection of telephone equipment will become considerably more diverse. Telephones with amplified sound, conference call telephones, additional receivers, and so on. Indeed, not everyone will need all these special features. Therefore, a simple digital telephone will still be predominant in the 1990's.

Telecopying

A telecopier terminal and a display unit will represent two important attachments to the telephone. A 3-minute telecopier unit is a unit which will transfer information contained on a normal A4-size sheet in 3 minutes -- now costs approximately 20,000 markkas if it is equipped with an automatic receiver. In Finland the monthly rental fee is 420 markkas plus telephone costs.

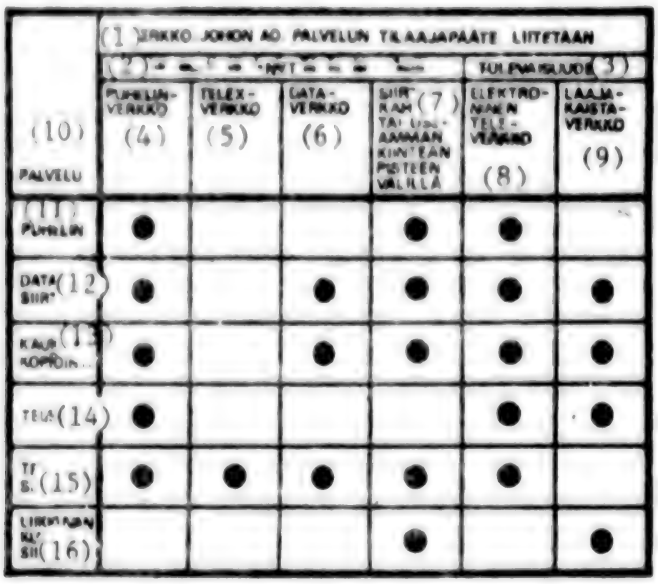
The telecopier is an effective method of rationalizing dispatches in an advertising agency or newspaper office or the operations of the various offices of an enterprise. The cost is probably still too high as far as general use is concerned. One minute equipment is three-four times more expensive.

In France and Japan where the need for telecopying equipment is great, the so-called "people's fax" is now being developed. This is a telecopier unit, the cost of which would be perhaps several thousand markkas even in its simplest form.

In the 1990's the telecopier may become standard equipment for every conference room. A telephone conversation between two directors can be cut off for a while since the information on paper can be transferred to the other end of the connection.

An A-4 sheet can be transferred by means of an electronic tele-network in a matter of seconds. Here there is no limitation imposed by the network, only by the mechanical movement of the picture transfer terminal.

Perhaps in time the most important terminal for a tele-network will be a display unit with digital controls. Development will take several different paths in this direction.



Information Transfer Service and Information Transfer Networks
Various Methods of Effecting Various Tele-Services

Key:

1. Network to which consumer terminal will be attached.
2. Now.
3. In the future.
4. Telephone network.
5. Telex network.
6. Data network.
7. Transfer between two or more stationary points.
8. Electronic tele-network.
9. Wide channel network.
10. Service.
11. Telephone.
12. Data transfer.
13. Remote copying.
14. Telset.
15. Text transfer.
16. Transfer of a moving picture

Telset

The use of a conventional television receiver and a display terminal for showing text has been tried in Helsinki in recent years. This function will come into standard use in the near future and the most varied information can be stored in the Telset information bank: the latest news, encyclopedia material, schedules, conference programs, classified announcements, and so on.

When the microsphere located in the television receiver, which is needed to transfer the information coming from the telephone lines into a form suitable for the television receiver, is standardized on an international level, it can be mass-produced profitably. There is no reason that such a sphere cannot be installed in every receiver in the future.

Thus in the 1990's a television receiver will have three wires leading to it: electric, antenna, and telephone. On the front panel there would be a control button labeled "information bank", which when pushed would automatically connect the TV to the nearest telephone information bank.

Data Terminals

Data terminals have been used for years already as remote points for feeding information into a computer. For the time being, the users of data terminals have to have considerable knowledge in the feeding and obtainment of computer information.

With time their prices will drop and their use will become more simplified. ATK-based systems are being used more and more in small enterprises and offices.

Text Treatment

Various systems for treating the written word and text will significantly reduce the need for reprinting text. When a computer contact is added to such a system, a text transfer terminal is created.

Text stored in the memory of this system can be transferred by request to another memory bank of the tele-network. International standardization in this are is not yet complete.

Hopefully at the end of the 1980's the equipment of various manufacturers will be standardized. Thus the field of text transfer would receive a considerably incentive for growth.

The average business letter is usually 1.5 pages in length. The transfer time of such a letter would be approximately 15 seconds.

Telex

Telex came to Finland in 1945 and elsewhere it has grown from a modest beginning into a world-wide network. There are now more than a million telex machines in the world, but the system's greatest efficiency at this time is its slowness, 6 2/3 type spaces per second in several countries.

When the telex terminal is revised and accelerated, the result will be the same as that of a text transfer terminal.

Communication Station

An enterprise of the 1990's will have an electronic subscriber switch or a central control system, to which various terminals can be attached. The digital telephone will become an effective communication station since it will be possible to connect it to picture transfer equipment as well as to a display terminal.

The display terminal can be tied up to a company computer, a Telset general information bank, or even used for outside correspondence.

Even in the future such a communication station will be a rarity. Its price will exceed the pocketbook of the average user and it is doubtful that John Doe will need these special features.

Thus the slowness of changes in the tele-network will not be a hindrance as long as we are able to serve the subscriber of the "new era" with electronic connections. The opportunities for this are good since it is in those very localities where most of those new subscribers are located that the need for renovation of the telephone network is the greatest even for other reasons.

10576
CSO: 5500

PROFESSOR DISCUSSES OPTICAL DATA TRANSMISSION

Helsinki UUSI SUOMI in Finnish 12 Feb 80 p 2

[Report on speech by Professor Seppo J. Halme to a meeting of the Finnish Academy of Sciences on 11 February 1980]

[Excerpt] Professor Seppo J. Halme, an expert in information transfer technology and director of the electrical engineering department of the Technical College, delivered a speech on optical data transmission through glass fiber at a meeting of the Finnish Academy of Sciences on 11 February 1980. The article below is an abridgment of this speech.

At this time in Finland nearly 50 people are involved in the development of and research on optical data transmission. Of these people approximately one-fourth are working in the data transmission laboratory of the Technical College.

From Experiments to Reality in Finland

Today optical transmission is a reality by means of light cables. The Postal and Telegraph Service conducted a field test on the first Nordic tele-equipment in Hyvinka in 1979. Shortly after that the Helsinki Telephone Company also began a test in Hameenkyla with light cables, through which telephone traffic has been traveling since last fall, for the first time in the Nordic countries. The Nokia Corporation has developed domestic light cables and their attachments, which are already being tested. Early testing is justified in order to obtain operational experience with respect to the effects of Finland's environmental conditions on this new equipment. Concern has been expressed with respect to frost, water, frost in the ground, and ditch digging!

It seems that in the initial stage light cable connections will be put into operation to replace conventional telephone cables between telephone exchanges. The first connection was ordered by the Savolinna Telephone Company to be installed between Savolinna and Kerimaki, for which many people will be very happy, especially during the opera festival. Numerous other connections are still in the preparatory phase. In the near future it will

become possible to install a light cable under the Aland Sea without any intermediate boosters [repeaters], the objective of which is to achieve Edelcrantz's record distance and increase the transmission capability approximately a billionfold at the same time.

The Necessary Quartz From our Own Country

Theprice of metal conductor cables has been continually rising, especially in recent times. This has resulted in the fact that the quartz-based hair-thin light conductor has become rather advantageous. Its basic raw material, quartz, can be found in unlimited amounts even in Finland. The invention of the light cable has thus come at a very appropriate time since there is serious concern that copper supplies may come to an end or at least become very expensive.

In the first optical transmission systems the area of operation will be approximately 0.8 micrometers, slightly above the longest wave length of visible light, 0.7 micrometers, in the infrared range. Thus the communication intervals achieved without intermediate repeaters are 3-8 kilometers. The light conductor is much more penetrating in the longer wave lengths of 1.3 micrometers. A communication interval of 53 kilometers has already been achieved in a laboratory test in Japan. By using even longer waves and new raw materials researchers believe that they will be able to accomplish intervals which are even tenfold longer without any intermediate repeaters. Better and better solutions are continually being found. Optical transmission technology will soon become the overwhelming solution for stationary connections and is rapidly growing.

Operational Opportunities

The suitability of optical transmission also depends on expenditures in spite of its technical possibilities. Thus it must be asked whether it can be used in present data transmission services and whether it is possible to find new additional services to which it can be applied.

The information transferred in data transmission can be speech, data, telegraph codes, a stationary picture, a television picture, as well as remote measuring or remote control data. The largest investments and funds are overwhelmingly connected with telephone operations. Optical transmission is particularly applicable to long distance conducting and network conducting between telephone exchanges.

The number of transferrable channels per glass fiber are with current equipment 30..7680. The use of light cables goes very well together with the digital system of the tele-network, in which Finland is one of the world's leading countries. In the initial stage the light cable will not yet extend all the way to the subscriber so that the telephone user will not notice any difference other than an improvement in the quality of sound, which will primarily be the result of numerical transmission.

Numerical transmission means that patterns of the electric oscillations of the microphone are taken 8,000 times per second. Each pattern is represented by the total number of a dual system, the numbers of which, one and zero, are transmitted one after another. A significant portion of the investments of the telephone network is directed toward numerical systems since they are less expensive than the previous so-called analogous technology. Lower expenditures will gradually mean lower telephone costs in real value and also more extensive use of the telephone.

Possibilities of the Cable Television Network

Several other tele-services such as data transmission and the telegraph are based on the use of the telephone network. Thus optical transmission also benefits them. Something significantly new is coming in the area of joint antenna- and cable television network. In Finland the prevalence of the joint antenna network is probably the highest in the world. Finland is also the site of the only manufacturing plant of this field in the Nordic countries. The use of more extensive cable networks has been retarded by the high costs of cable and the technical limitations of transmission, which the light cable will gradually alleviate.

The AiOVIS-project in Japan (Higashi Ikoma Optical Visual Information System) has probably aroused the most international attention among the light cable projects. The above-mentioned project concerns a cable television system planned for 160 subscribers, the development of which is being funded by the Japanese Ministry of Foreign Trade. The light cable network offers a two-directional connection between the distribution center and the home terminal. By using a return connection the subscriber can transmit program requests and even other information. A school, hospital, and a city hall have been equipped with the means of program production and a tie-up with the distribution center. In Europe the best conditions exist in Finland for developing a cable television experiment by using light cables. Domestic industry would be prepared to do this.

The transmission capability of light cables is so great that it can meet all the needs that are now imaginable. It would make sense to transmit many different types of information along the same path in order to save on expenditures. Light cables are a natural basic structure for a multiservice network. In addition to speech and data stationary pictures and television programs can also be transmitted or received. An information hook-up needed in the home or at the jobsite can be arranged by using only one light-conducting fiber. The same network can function as a telephone network as well as a cable television network without overlapping investments. The intelligence needed by the network can already be accomplished with current micro-processor chips.

This field of science is in no way easy since because of its economic significance, the best research and development efforts are being made by enterprises. Development is progressing at an exceptionally rapid rate. Can there be anything left to do in Finland under such conditions? In any case we must work quickly and try to put as much as possible into the area of research.

At this time nearly 50 people in Finland are working on research and development connected with optical data transmission. Of this group approximately one-fourth are working in the data transmission laboratory of the Technical College. Work in Finland has for the most part consisted of following international developments and learning new technology. In approximately a period of a year it has been possible to come up with some of our own results, which deal with experimental systems, cable designs, and measuring equipment.

Theoretical work has been conducted for the purpose of understanding reception sensitivity and light propagation. Also publications about new research results have begun to appear at an accelerating rate and the first licentiate work and dissertations are coming. In the near future research connected with optical data transmission will become one of the most important research areas in our country. It is also justified since we are rapidly becoming an information society in which our material and intellectual life will be based less on energy and natural resources than information.

10576
CSO: 5500

TELECOMMUNICATIONS RESEARCHER: COUNTRY WILL JOIN NORDSAT

Helsinki HELSINGIN SANOMAT in Finnish 22 Feb 80 p 14

[Article by Risto Varteva: "Nordsat Soon to Become a Reality"]

[Text] The joint Nordic country television satellite, Nordsat, has been the subject of discussion for a long time already, but Professor Esko Heikkila, at least, believes that it will soon become a reality.

"Indeed, we could get by with a ground based network, but the satellite offers a competitive alternative," states Heikkila, director of the tele-equipment laboratory of the State Technical Research Center (VTT).

On this basis VTT has over a period of 2 years developed a satellite television receiver or supplementary equipment, by which programs transmitted by the satellite are subsequently transmitted to one's picture tube. The name of the equipment is long, at least for the time being. "In general, we here at VTT have the habit of inventing some kind of an acronym for a new product. However, no such acronym yet exists," laughs Heikkila.

VTT itself will not be the manufacturer of this supplementary equipment needed by Nordsat. "Our task is product development, on the basis of which it is possible to begin undustrial production. This development work includes many Finnish corporations, it will be interesting to see which ones will be involved when production begins."

According to Heikkila the objective in any event is Central Europe, since "there is where the markets are".

Satellite television is, however, only a portion of the work being conducted by the tele-equipment laboratory. In general, the emphasis is on data transmission, but radar equipment is also included: for example, Finnish low altitude surveillance radar was developed at VTT. It was the laboratory's largest contract so far.

Not all product development is aimed at immediate production. "All different kinds of experiments are conducted here. We also concentrate on questions which are far from being ready for industrial production," states Heikkila.

In addition to product development the tele-equipment laboratory's tasks also include quality control. "This extends from televisions to electronic systems for ships," Heikkila cites the extremes. "But in testing we are neutral. We present only the results, we do not comment on them." This way the consumer as well as the manufacturer is served.

The close tie with industry ensures the fact that 70 percent of the annual expenditures of 7 million markkas of the tele-equipment laboratory are covered by compensation received from outside projects.

10576
CSO: 5500

AUTOMATED MARINE MOBILE PHONE SYSTEM TO START IN 1981

Oslo TELEKTRONIKK in Norwegian No 4, 1979 pp 344-348

[Article by B. Løken and G. Trøan]

[Text] An automatic mobile telephone system in the UHF band will be put into operation in Norway in 1981. This article describes a planned use of this system for an interim automatic short-range service for the North Sea and the Norwegian Sea, especially with a view to handling traffic in connection with oil exploitation on the Norwegian continental shelf.

1. Introduction

For a number of years the Scandinavian telecommunications administrations have collaborated on the development of a common automatic mobile telephone system. This Scandinavian mobile telephone system is often spoken of as the NMT [Scandinavian Mobile Telephone] system. The first automatic exchange, according to plans, will be put into operation in Oslo in 1981 for coverage of East Norway. West Norway will follow in 1982 with an exchange located in Bergen. Exchanges are also scheduled to be put into operation in Trondheim in 1984 and in Bodø in 1985.

Putting this system into operation opens up the possibility of automating short-range services for marine units for relatively modest extra investments. Such a service is planned to be put into operation on an interim basis in 1981-1982 until an international solution can be effected. "Marine NMT" is intended precisely to provide this special application of the mobile telephone service. The NMT system and the plans for expansion of the mobile telephone service are described in [1].

2. Background of Development of an Automatic Interim Service

In [illegible]-traffic areas the channel capacity of today's short-range service in the VHF band is almost completely utilized and does not afford the possibility of satisfactory handling of the traffic. Units engaged in oil operations are making ever greater demands on radio channels and handling

capacity at the coastal stations. Transfer of these big consumers to an automatic service and a frequency band of their own may for that reason acquire great importance for fishing and other vessels in ordinary coastwise service, in that:

1) This would make handling capacity available at the coastal stations and

2) The traffic from the oil industry would not burden the ordinary marine channels.

3. Future Automatic Short-Range Service

Work is now actively going on in several international forums toward setting specifications for a marine mobile short-range service in the VHF/UHF bands. There are several reasons that the teleadministrations wish to automate, including improving the balance between expenditures and income and improving the service through shorter delays.

To be able to use an automatic service even when Norwegian ships are outside of other countries' coastal waters, it is necessary to use a standardized international system. It is calculated, however, that development of such an international system cannot be begun before 1985-1990.

4. Development Plans

While waiting for an international system, the telecommunications office wants to improve conditions for the hard-pressed short-range service by introducing an automatic interim system on new frequencies. According to plans this will take place in 1982 with the putting into operation of the Bergen mobile telephone exchange (Bergen MTX, Mobile Telephone Exchange). Since there is a present need, the service may be put into operation immediately after the automatic excahnge in Oslo is opened in 1981. To the MTX are connected ordinary base stations for NMT in the UHF band, which with directional antennas give the greatest possible coverage offshore.

The service is primarily an offer to vessels that are engaged in oil exploitation on the Norwegian continental shelf, i.e. supply vessels, drilling rigs, lighters at the work sites, production platforms, and other vessels, both Norwegian and foreign, that are regularly connected with oil exploitation. It is hoped that the great bulk of their telecommunications traffic, which makes up about 60 percent of the traffic of the Bergen and Florø radio today, will switch to the interim system. That will free the capacity for handling traffic with the other vessels along the coast.

In case of an extension of the oil drilling north of the 62nd parallel, the interim system could be used by connecting marine base stations that cover these waters with the Bergen MTX (or perhaps another MTX).

In addition, any vessel that works the areas that are covered by the interim system could get a marine NMT station.

4.1. Areas of Coverage

To give good coverage in the North Sea, NMT base stations for marine use must be set up on the high-lying station points along the coast (e.g., Gulen, Stord, Bjerkreim). These will be conventional base stations with 50 w broadcasting power. The stations are equipped with directional antennas that will give overlapping coverage at sea. Under normal conditions this will give a satisfactory level of service up to about 80 to 105 km from land.

To reach further it will be possible to a certain extent to use directional antennas on board drilling platforms and to use radio equipment of greater power than usual. Under favorable conditions this will make it possible to establish usable communication up to about 120 to 185 km from land. The marine units are expected to use approved automatic mobile stations as terminal equipment, perhaps modified for marine use.

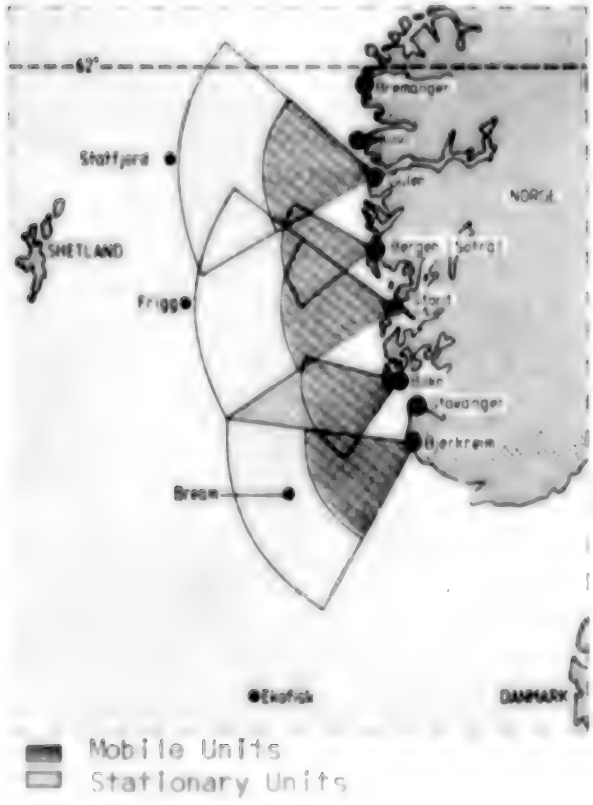


Figure 1. Area of coverage south of the 62nd degree of latitude

To achieve satisfactory coverage of individual and special harbor installations, there may be need for supplementary base stations along the coast. It is also assumed that the marine units will be able to use the base stations already established for the mobile telephone when they are near land.

As for capacity, the interim system will have five channels with the possibility of an expansion to eight.

Propagation measurements will also be done in 1979 and 1980 to get real figures for the coverage.

South of the 62nd Parallel

Figure 1 shows the planned station sites with the expected areas of coverage for UHF. Gulen, Stord, and Bjerkreim will be established in 1981 and 1982. Bokn, Sotra, and Kinn will be established for supplementary coverage toward the big supply bases if the need arises. Bremanger is also regarded as an alternative to Gulen.

North of the 62nd Parallel

It is planned to cover the Haltenbank with a station at Kopparen, as shown in Figure 2 [not reproduced here]. Figure 3 [not reproduced here] shows the coverage of the Tromsø area with a station at Trolltind, Arnøy.

5. Functions and Services

The same functions and services that are offered to mobile telephone subscribers are available for the marine users.

Conversations are set up automatically and charged on the basis of the numbers dialed. A call to a marine subscriber is automatically routed to the right coverage area without the caller's needing to know what marine or land mobile base station the vessel receives radio coverage from.

Ship to ship contact is possible and is established in the usual way via the automatic exchange. The coast station, like other subscribers, can reach vessels in the marine NMT system by dialing the vessel's telephone number.

Automatic updating (roaming) in a new coverage area and switching of conversations in progress from one base station to another are functions in NMT that are also a part of the interim system.

Of special services, it is intended to offer:

a) Blocking of certain types of call from the ship,

b) Switching to a recording with standard text,

c) Switching to another number, and

d) Statement of the charge (for calls from the ship).

6. Radio Frequencies

The following frequency bands are reserved for the NMT system:

453.0-457.5 megahertz for mobile station transmitters and

463.0-467.5 megahertz for mobile station receivers.

With an interval of 25 kHz between channels this gives a total of 180 channels. The duplex interval is 10 MHz.

7. Description of the System

As for system there is little difference between marine NMT and land NMT. The principal difference lies in the fact that the stationary marine stations will have higher transmitting power and that the marine channels will only be able to used by marine stations. There are also plans for sector coverage from the marine base stations.

Since the technical solutions for the NMT system have already been described in [1], only a brief summary of the interim system will be given here.

3.1. Net Structure

Figure 4 [not reproduced here] shows the net structure for the interim system. The exchange is connected to the stationary network at the long-distance exchange level.

The marine coverage area is divided into smaller areas called traffic areas. A traffic area may comprise several base stations.

A ship station is considered as having moved into a traffic area when the exchange has registered and stored information that the vessel is in the area. The exchange, on the other hand, has no knowledge of what base station the vessel is getting radio coverage from. This means that a selective call to a ship must be sent out over all the base stations of the area to be sure that it will be received on the ship. When it sails into another area, the ship station must report its new position so that the selective call from then on will be sent out to the new area. These updatings take place automatically. The traffic area can therefore be considered as the smallest unit for position reporting in the system.

All channels in a traffic area are designated by digital signals which give the channel type (calling channel or traffic channel) and the traffic area. The traffic area designations also indicate what country the area is located in. An ordinary land mobile NMT station can communicate with any area at all that has an approved Scandinavian country designation. By designating the channels in the marine traffic area with a country indication that is outside of the Scandinavian series and allowed only for marine stations it is possible to make these channels exclusive for marine users. This way a marine short-range service is integrated into the same automatic equipment, while at the same time they are logically two separate systems. A marine station can also communicate with both marine and land mobile traffic areas.

The signaling system in the NMT has the capacity for a total of 16 different land designations, each with a finer classification into 16 traffic areas. The marine coverage area can therefore be divided if necessary into several traffic areas.

3.2. Signaling System

In the NMT digital signaling is used between exchange and mobile station. The signaling is done in duplex, the information being transmitted in a fixed framework structure. The modulation method is FFSK (fast frequency shift keying, modulation frequencies 1,200 Hz and 1,800 Hz). The data speed is 1,200 bits per second. An error-correcting code is used to increase the signaling security under varying conditions of transmission.

7.5. Organization of the Radio Channels

Each base station in marine NMT has a call channel and a number of traffic channels. The call channel is used for sending selective calls to the marine stations, which in the inactive state are always switched to a call channel. All telephone traffic is carried on the traffic channels.

The call channels and idle traffic channels are continuously marked with digital signals so that the mobile stations can recognize them. At the smaller base stations the call channels can also be used as traffic channels.

Calls to a Marine Subscriber

The marine NMT stations when inactive are locked into a call channel. Upon detection of a selective call signal, which, as mentioned above, is sent out to all base stations in the traffic area, the station receipts on the return frequency of the call channel in question. The base station is thus identified and the exchange can direct the mobile station to a vacant traffic channel. The remaining signaling and the conversation are carried on that channel.

Calls From a Marine Subscriber

In case of a call from a marine subscriber the station itself will look for a vacant traffic channel and send a call signal. Exchange of identification signals and transmission of number information then take place automatically.

Updating

The mobile station has an automatic procedure for updating itself to the system when it moves from one traffic area to another. The decision to update is reached when the station connects with a call channel with a different traffic area designation from the one it has stored in its register.

Continuity Test and Switching of Continuing Conversations

The base stations monitor conversations with a tone at about 4,000 Hz which is sent in a loop from the base station to the mobile station and back to the base station. On the basis of the signal/noise ratio the exchange can either disconnect poor connections or switch them to another channel at a different base station.

8. Numbering and Routing

The marine NMT stations are assigned numbers from the same 6-digit number series as the land mobile NMT stations. The service access code is also the same, i.e. 94.

A marine station is identified with a 7-digit number $ZX_1X_2X_3X_4X_5X_6$, where Z indicates that it is a Norwegian station and the other digits the station's number in the number series.

The country indicator 2 is used only internally in the NMT net and is assigned on radio links by the exchange. However, the capacity in the net sets restrictions on the length of domestic numbers. For that reason X_1 will be omitted in the first instance in the stationary net and added in on the radio side.

A marine subscriber, consequently, will dial $094X_2X_3X_4X_5X_6$, where 0 is the national prefix.

X_2X_3 selects the automatic exchange for the interim service. Consequently, a call to a marine subscriber is always routed to that exchange.

9. System Components and Equipment

9.1. Mobile Telephone Exchange

The mobile telephone exchange belongs to the "AX family," and is a more advanced version of AXE.

The exchange is the controlling unit in the interim system. According to the system solution there is no further distinction on the part of the exchange between the marine and land mobile service. The number plan is the same for both groups of users, and both are registered in the same subscriber register, i.e. the register of the traffic area in which the stations are located and what services they can avail themselves of. The marine channels are administered in the same way as the land mobile channels, but they have a different marking.

The interim system is expected to be located at the Bergen MTX. However, there are no systematic obstacles in the way of placing the service at a different MTX or dividing it among several.

9.2. Base Stations

The base stations are ordinary NMT base stations with directional antennas. The stations will be located at places where other expansion is going on under the direction of the telecommunications authority.

An NMT base station is controlled and monitored with the aid of the same FFSK signaling system as is used between the mobile units and the exchange. The signaling goes directly on the individual channels, which are equipped with the necessary modem and control logic.

9.3. Marine Stations

The marine stations will be approved automatic mobile stations modified for marine use.

A mobile station is shown schematically in Figure 5 [not reproduced here]. The service section constitutes the boundary section between user and system. This part consists among other things of microtelephone, a set of buttons, various service indicators (both lights and tones), and in some

cases microphone/loudspeakers, short-number dialing, and national selectors. Preselection of number is obligatory. A marine subscriber will be able to communicate with the marine coverage area by setting the national selector for it.

The logic and control section carries out the necessary functions in the station. The radio section in an ordinary NMT station consists of 180 transmitter-receiver channels with frequency synthesis and duplex filter.

10. Conclusion

At moderate cost the interim system will make a new frequency band available for maritime short-range services. This will improve the traffic situation both for the traditional users of the VHF service and for vessels engaged in the oil drilling. We have thus satisfactorily overcome a number of the capacity problems that will arise until a new international system can be put into operation.

BIBLIOGRAPHY

1. Løken, B.; Gurstad, K.; Børresen, A.; and Myhre, H. "NMT-systemet. En fellesnordisk, automatisk mobiltelefonsystem" [The NMT System. A Joint Scandinavian Automatic Mobile Telephone System], TELEKTRONIKK, Oslo, No 2, 1979, pp 344-348.

TELETEXT, TELEDATA, TELEFACSIMILE SYSTEMS SOON

Stockholm SVENSKA DAGBLADET in Swedish 26 Feb 80 p 29

[Article by Bengt Olwig and Berit Christiernin]

[Text] Within the not too distant future, we shall encounter things like teletext, teledata and telefacsimile systems, in business as well as in our private lives.

Teletext is one of the news which will appear very soon. It is a method for the transfer of text information via ordinary TV transmitters.

In order to be able to receive the information, little additional equipment is needed for the ordinary TV receiver. Offered are various types of text information, for example the latest news on the domestic and foreign scenes, sports results, weather forecasts, entertainment information etc.

The communication is only in one direction and does not affect the reception of ordinary TV transmissions.

Here in Sweden, tests are, at present, being carried out with teletext at the Swedish Broadcasting and Television Corporation as well as at Swedish Phillips. Regular teletext operations today take place in Great Britain.

Teledata

Teledata is similar to teletext. The difference between the two systems is that teledata is based on the transfer of information from one or several data processors to a terminal in the home or at the place of work via the telecommunications network. Just as in the case of teletext, the terminal may consist of a conventional TV set with suitable additional equipment.

Telefacsimile

Telefacsimile may be described simply as a method for remote copying of text and pictures. In Japan, work is already in progress to develop telefacsimile equipment for home use.

The areas of application are many. It is, for example, not inconceivable that telefacsimile will be used in the distribution of daily newspapers. Another interesting area is the so-called transfer of electronic mail. A message is sent from a viewing screen to the receiving telefacsimile set, which copies it--with letterhead, signature and everything!

According to experts, electronic mail will take over the distribution network of today's business letters within the near future.

Both teledata and telefacsimile may, therefore, become hard nuts to crack for politicians. A complicated technique has also here been developed more rapidly than another one--electronics versus politics. If it becomes possible to bring the two into agreement, the eighties will have lots of news to offer.

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LM ERICSSON'S PROBLEMS DELAY NORDIC DATA NETWORK TO 1981

Stockholm SVENSKA DAGBLADET in Swedish 26 Feb 80 p 29

[Article by Bengt Olwig and Berit Christiernin]

[Text] The growing data networks are becoming increasingly important in the communication among enterprises, organizations and scientists. One of these networks is the Nordic data network which, however, has been delayed considerably and is the subject of a lively debate in the data processing field.

Via data networks, usually based upon conventional telecommunication lines, telecommunication among data network systems takes place. As far as the Nordic countries are concerned, the big event in this area is the Nordic data network, which, when ready, will offer data network users in Sweden, Denmark, Norway and Finland possibilities of an extensive transfer of information among the Nordic countries as well as with other parts of the world.

Delays of Teleworks

According to the original plans, the system would be in operation already during the spring of this year, but, today, it is clear that the original time schedule has been substantially upset. The reason is that LM Ericsson, the supplier of the electronics, has encountered unexpected difficulties. An acceptance test within the four affected telecommunication services at the end of last year revealed no less than approximately 80 serious defects in the system presented.

LM Ericsson is today working feverishly to solve the problems and prepare new time schedules. It is possible that the first subscribers may be offered to test the data network free of charge until the fall. And, in that case, the general data network could be opened for commercial use in early 1981.

Among the first customers will be the banks, which plan to connect their automatic cash dispensing systems to the data network.

The choice of network technique has been the subject of debate. In principle, there are two possible techniques. The teleworks chose one of them, and, since then, the suppliers of the date processing equipment and some of the customers dependent upon them have been criticizing the teleworks on account of it. The teleworks has been defending its choice by arguing, among other things, that the other Nordic countries wanted the technique chosen, and that the other technique is being gradually introduced as well.

Additional Data Networks

Now it is not only the telecommunication services which have data networks. During the last decade, a large number of private or special data networks have developed--some of them world-wide. It has not been possible to obtain data on the total number of networks, for example, in Sweden. There simply are not any figures on the subject available to the public.

It is clear, however, that the number of data networks today is significant. Big enterprises, for example, often have internal data networks which extend far beyond the borders of the country. The same thing applies, for example, to service data centers, banks and insurance companies.

The authorities, the public administration and public-service corporations are other examples of large-scale users of data networks.

According to a British study carried out at the request of six OECD countries, it appears that Europe has no less than 130-150 international private data networks. These comprise everything from special data networks for scientific exchange of information to the channels of information of news agencies and airline companies. Well-known names in this context are, for example, Reuter's Europlex, Monitor Network, Sita (the seat reservation system of airline companies) and the Swift network (banking system for international monetary transactions).

European Network

In March of 1975, the Council of Ministers of the EC gave the European Commission the go-ahead to develop a data network within the EC. This network, which was christened Euronet, started its commercial operation at the end of 1979 and is expected to be fully completed toward the end of 1982. The possibility for non-EC countries to join exists and has been planned. The purposes of the Euronet are, among other things, to bring together different information bases, to provide for direct acquisition of information for terminals anywhere within the network and to further the trend toward the development of big information bases within the areas of energy, industries, agriculture, medicine, metallurgy, environmental control, and patents.

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